

Appln. No. 10/065,960
Docket No. 125517/GEM-0071

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A method of gating for a medical imaging system, the method comprising:

selecting a non-electrical sensor, the non-electrical sensor being an acceleration sensor; [[and,]]

utilizing the non-electrical sensor to acquire information for gating; and

gating using the acquired information.

2. (currently amended) The method of claim 1 ~~further comprising~~ wherein the gating comprises gating within a magnetic resonance imaging system.

3. (currently amended) The method of claim 1 ~~further comprising~~ wherein the gating comprises gating within a computed tomography imaging system.

4. (currently amended) The method of claim 1 ~~further comprising~~ wherein the gating comprises gating within a PET-CT imaging system.

5. (currently amended) The method of claim 1 ~~further comprising~~ wherein the gating comprises gating within an X-ray imaging system.

6. (currently amended) The method of claim 1 ~~further comprising~~ wherein the gating comprises gating within an ultrasound imaging system.

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7. (original) The method of claim 1 further comprising determining timing of a gating signal to be prior to displacement of a body part of a patient.

8. (original) The method of claim 1 further comprising obtaining a gating signal using signature analysis.

9. (original) The method of claim 8 wherein using signature analysis includes providing a training set within a database and employing a pattern recognition technique to extract a gating signal.

10. (currently amended) A method of gating for a medical imaging system, the method comprising:

selecting a non-electrical accelerometer;

utilizing the non-electrical accelerometer to acquire information for cardiac gating; [[and]]

sensing cardiac vibrations with the accelerometer and acquiring an acceleration waveform with the accelerometer; and

gating using the acquired acceleration waveform.

11-12. (canceled)

13. (previously presented) The method of claim 10 further comprising calculating a first derivative of the acceleration waveform to obtain a jerk waveform, determining a salient-peak of the jerk waveform, and utilizing the salient-peak as a trigger point for cardiac gating.

14. (original) The method of claim 10 further comprising obtaining a gating signal using signature analysis.

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15. (original) The method of claim 14 wherein using signature analysis includes providing a training set within a database and employing a pattern recognition technique to extract a gating signal.

16. (currently amended) A method of gating for a medical imaging system, the method comprising:

selecting a non-electrical sensor, the non-electrical sensor being a force sensor;
[[and,]]

utilizing the non-electrical sensor to acquire information for gating; and
gating using the acquired information.

17. (canceled)

18. (currently amended) A method of gating for a medical imaging system, the method comprising:

selecting a non-electrical accelerometer;
arranging the accelerometer on a wrist of a patient; [[and,]]
utilizing the non-electrical accelerometer to acquire information for peripheral pulse gating; and
gating using the acquired information.

19. (canceled)

20. (previously presented) The method of claim 18 further comprising obtaining an acceleration waveform from the accelerometer, calculating a time delay for information being transmitted from a heart of the patient to a peripheral pulse, and characterizing the signal.

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21. (currently amended) A sensor assembly comprising:

a non-electrical sensor from a group consisting of a force sensor, and an ultrasonic sensor, ~~and an interferometer resting on a vibrating surface~~; and,

a patient-sensor interface having a first end and a second end, the first end adapted for securing to a patient, the second end coupled to the sensor.

22. (original) The sensor assembly of claim 21 further comprising a sensor box for acquiring information from the sensor.

23. (original) The sensor assembly of claim 22 further comprising means for signal processing and computer analysis, wherein the means for signal processing and computer analysis receives input from the sensor box.

24. (original) The sensor assembly of claim 21 wherein the patient-sensor interface is fluid-filled, non-metallic, non-conducting tube.

25. (currently amended) A method of using a sensor for gating, the method comprising:

providing a non-electrical accelerometer;

providing a fluid filled transmission tube having a first end and a second end;

attaching the first end of the fluid filled transmission tube to a chest wall of a patient adjacent a heart of the patient;

attaching the second end of the fluid filled transmission tube to the sensor; ~~[[and]]~~

utilizing the non-electrical accelerometer to acquire information for gating; and

gating using the acquired information.

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26. (original) The method of claim 25 further comprising placing the sensor out of a field of view during an imaging process.

27-28. (canceled)

29. (original) The method of claim 25 further comprising connecting the sensor to a sensor box via an electrical connection for recording information acquired by the sensor.

30. (original) The method of claim 29 further comprising sending information from the sensor box to a signal processing and computer analysis station.

31. (original) The method of claim 25 wherein providing a non-electrical sensor comprises providing a sensor having a bandwidth of at least 125 Hz.

32. (previously presented) The method of claim 1 further comprising utilizing the non-electrical sensor to acquire information for respiratory gating.

33. (previously presented) The method of claim 32 further comprising obtaining an acceleration waveform with the accelerometer, integrating the acceleration signal twice to obtain a resultant signal, band pass filtering the resultant signal to remove frequencies that cause drift in the resultant signal and frequencies corresponding to cardiac motion to obtain a filtered signal, analyzing the filtered signal for salient peaks, and obtaining a trigger point for respiratory gating.

34. (previously presented) The method of claim 16 further comprising utilizing the non-electrical sensor to acquire information for respiratory gating.

35. (previously presented) The sensor assembly of claim 21, wherein the non-electrical sensor is the accelerometer.

36. (canceled)

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37. (currently amended) A method of using a sensor for gating, the method comprising:

providing a non-electrical accelerometer;

providing a fluid filled transmission tube having a first end and a second end;

attaching the first end of the fluid filled transmission tube to a wrist of a patient adjacent a radial artery of the patient;

attaching the second end of the fluid filled transmission tube to the sensor; [[and]]

utilizing the non-electrical accelerometer to acquire information for gating; and

gating using the acquired information.

38. (canceled)

39. (new) The method of claim 1 further comprising:

in response to the acquired information from the acceleration sensor, calculating a first derivative of an acceleration waveform to obtain a jerk waveform, determining a salient-peak of the jerk waveform, and utilizing the salient-peak as a trigger point for the gating.